

BASF Aktiengesellschaft

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We claim:

- 5 1. A method of fabricating a membrane-electrode assembly (MEA), particularly for PEM fuel cells, wherein the MEA comprises a polymer-electrolyte membrane (PEM) with reaction layers applied to both sides and possibly with gas distribution layers, and at least one of the reaction layers includes at least one catalytic component and an electron conductor, the method
- 10 comprising the following procedural steps:
- A) The introduction of ions of the at least one catalytic component into the polymer-electrolyte membrane and/or into an ionomer introduced into the reaction layers,
- 15 B) the application of the electron conductor to both sides of the polymer-electrolyte membrane,
- C) the electrochemical deposition of the ions of the catalytic component from the polymer-electrolyte membrane and/or from the ionomer, introduced into the reaction layers, on the electron conductor onto
- 20 at least one side of the polymer-electrolyte membrane.
- 25 2. The method as claimed in claim 1, wherein the electrochemical deposition of the ions of the catalytic component in step C) is carried out under fuel cell conditions.
- 30 3. The method as claimed in claim 2, wherein a variation of operating conditions is effected during the deposition under fuel cell conditions.
4. The method as claimed in claim 1, wherein the electrochemical deposition of the ions of the catalytic component in step C) is carried out under electrolytic conditions.

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5. The method as claimed in claim 4, wherein the electrolytic conditions comprise the application of a constant or time-variant DC voltage or an AC voltage.
- 5 6. The method as claimed in claim 1, wherein in step C) at least one element from the 3rd to 14th group of the periodic table of the elements is deposited as the catalytic component onto the electron conductor on at least one side of the polymer-electrolyte membrane.
- 10 7. The method as claimed in claim 1, wherein in step C) at least one of the elements Pt, Co, Fe, Cr, Mn, Cu, V, Ru, Pd, Ni, Mo, Sn, Zn, Au, Ag, Rh, Ir or W is deposited as the catalytic component on the cathode-side electron conductor.
- 15 8. The method as claimed in claim 1, wherein in step C) at least one of the elements Pt, Co, Fe, Cr, Mn, Cu, V, Ru, Pd, Ni, Mo, Sn, Zn, Au, Ag, Rh, Ir or W is deposited as the catalytic component on the anode-side electron conductor.
- 20 9. The method as claimed in claim 1, wherein the electron conductor comprises carbon in the form of a bonded fiber web, fibers or powder.
10. The method as claimed in claim 1, wherein the electron conductor applied in step B) comprises at least one catalytic component from the group consisting of Pt, Co, Fe, Cr, Mn, Cu, V, Ru, Pd, Ni, Mo, Sn, Zn, Au, Ag, Rh, Ir or W.
- 25 11. The method as claimed in claim 1, wherein in step B), together with the electron conductor, an ion conductor is applied to at least one side of the polymer-electrolyte membrane.
- 30 12. The method as claimed in claim 1, wherein the catalytic component in step A) is introduced into the polymer-electrolyte membrane in an amount of from 0.000005 to 0.05 mmol/cm².